

Name _____

Solve the rational equation.

$$1) \frac{1}{x} + \frac{1}{x+4} = \frac{x+5}{x+4}$$

1) _____

$$2) \frac{1}{x} + \frac{1}{x+6} = \frac{x+7}{x+6}$$

2) _____

$$3) \frac{x}{2x+2} = \frac{-2x}{4x+4} + \frac{2x-3}{x+1}$$

3) _____

$$4) \frac{4}{3x} - \frac{1}{x+1} = \frac{3}{2x^2+2x}$$

4) _____

$$5) \frac{5}{4x} - \frac{1}{x+1} = \frac{1}{3x^2+3x}$$

5) _____

$$6) \frac{9}{y+5} - \frac{7}{y-5} = \frac{2}{y^2-25}$$

6) _____

$$7) \frac{9}{y+4} - \frac{6}{y-4} = \frac{12}{y^2-16}$$

7) _____

$$8) \frac{x}{x-5} - 4 = \frac{5}{x-5}$$

8) _____

$$9) \frac{x}{x-4} - 3 = \frac{4}{x-4}$$

9) _____

$$10) \frac{x}{x-1} - 3 = \frac{1}{x-1}$$

10) _____

$$11) \frac{x}{x-8} + 3 = \frac{8}{x-8}$$

11) _____

$$12) \frac{1}{x-2} = \frac{-2}{x-4} - \frac{2}{x^2 - 6x + 8}$$

12) _____

$$13) \frac{-1}{x+4} = \frac{1}{x+8} - \frac{4}{x^2 + 12x + 32}$$

13) _____

$$14) \frac{5}{x+4} = \frac{3}{x+8} - \frac{-20}{x^2 + 12x + 32}$$

14) _____

$$15) \frac{3}{x-4} = \frac{6}{x-8} - \frac{12}{x^2 - 12x + 32}$$

15) _____

Solve the problem.

- 16) A painter can finish painting a house in 8 hours. Her assistant takes 10 hours to finish the same job. How long would it take for them to complete the job if they were working together? 16) _____
- 17) A painter can finish painting a house in 5 hours. Her assistant takes 7 hours to finish the same job. How long would it take for them to complete the job if they were working together? 17) _____
- 18) One pump can drain a pool in 10 minutes. When a second pump is also used, the pool only takes 7 minutes to drain. How long would it take the second pump to drain the pool if it were the only pump in use? 18) _____
- 19) One pump can drain a pool in 4 minutes. When a second pump is also used, the pool only takes 3 minutes to drain. How long would it take the second pump to drain the pool if it were the only pump in use? 19) _____
- 20) A baker can decorate the day's cookie supply four times as fast as his new assistant. If they decorate all the cookies working together in 16 minutes, how long would it take for each of them to decorate the cookies working individually? 20) _____
- 21) A baker can decorate the day's cookie supply four times as fast as his new assistant. If they decorate all the cookies working together in 12 minutes, how long would it take for each of them to decorate the cookies working individually? 21) _____
- 22) A baker can decorate the day's cookie supply four times as fast as his new assistant. If they decorate all the cookies working together in 28 minutes, how long would it take for each of them to decorate the cookies working individually? 22) _____

Divide using long division.

$$23) \frac{4m^3 + 17m^2 - 36m + 36}{m + 6}$$

23) _____

$$24) \frac{6m^3 + 5m^2 - 9m + 10}{m + 2}$$

24) _____

$$25) \frac{4r^3 - 11r^2 - 16r - 16}{r - 4}$$

25) _____

$$26) \frac{3r^3 - 3r^2 - 1r - 10}{r - 2}$$

26) _____

$$27) \frac{2x^3 - 4x - 8}{x - 2}$$

27) _____

$$28) \frac{3x^3 - 112x + 24}{x - 6}$$

28) _____

$$29) \frac{6x^3 - 14x^2 + 23x - 18}{3x - 4}$$

29) _____

$$30) \frac{-6x^3 + 8x^2 + 23x + 14}{3x + 2}$$

30) _____

$$31) \frac{x^4 + 1296}{x - 6}$$

31) _____

$$32) \frac{x^4 + 16}{x - 2}$$

32) _____

Simplify the given expression.

$$33) 144^{1/2}$$

33) _____

$$34) 121^{1/2}$$

34) _____

$$35) 216^{1/3}$$

35) _____

$$36) 9^{1/2}$$

36) _____

$$37) 256^{1/4}$$

37) _____

$$38) 81^{1/4}$$

38) _____

$$39) \left(\frac{1}{100}\right)^{1/2}$$

39) _____

$$40) \left(\frac{1}{16}\right)^{1/2}$$

40) _____

$$41) \left(\frac{169}{400}\right)^{1/2}$$

41) _____

$$42) \left(\frac{49}{121}\right)^{1/2}$$

42) _____

$$43) 8^{4/3}$$

43) _____

$$44) 27^{4/3}$$

44) _____

$$45) 64^{-1/3}$$

45) _____

$$46) 8^{-1/3}$$

46) _____

$$47) \left(\frac{1}{25}\right)^{-1/2}$$

47) _____

$$48) \left(\frac{1}{64}\right)^{-1/2}$$

48) _____

Simplify the expression. Write the answer with positive exponents only. Assume that all variables represent positive real numbers.

49) $x^{1/9} \cdot x^{1/9}$

49) _____

50) $x^{1/9} \cdot x^{7/9}$

50) _____

51) $x^{2/3} \cdot x^{3/2}$

51) _____

52) $x^{1/3} \cdot x^{3/2}$

52) _____

53) $x^{3/2} \cdot x^{1/3}$

53) _____

54) $\frac{x^{2/8}}{x^{1/8}}$

54) _____

55) $\frac{x^{7/8}}{x^{6/8}}$

55) _____

56) $(x^{10}y^6)^{1/2}$

56) _____

57) $(x^4y^6)^{1/2}$

57) _____

$$58) (x^6y^4)^{1/2}$$

58) _____

$$59) \frac{x^{1/7}}{x^{1/11}}$$

59) _____

$$60) \frac{x^{1/5}}{x^{1/11}}$$

60) _____

$$61) (x^6y^8)^{1/2}$$

61) _____

$$62) \left(\frac{x^{1/5}}{y^{5/4}} \right)^2$$

62) _____

$$63) \left(\frac{x^{3/4}}{x^{5/4} \cdot x^{7/4}} \right)^8$$

63) _____

Answer Key

Testname: Q6 PREP CH 5.5, 5.6, 5.7, & 6.1 V01

- 1) {1}
- 2) {1}
- 3) {3}
- 4) $\left\{\frac{1}{2}\right\}$
- 5) $\left\{-\frac{11}{3}\right\}$
- 6) {41}
- 7) {24}
- 8) \emptyset
- 9) \emptyset
- 10) \emptyset
- 11) \emptyset
- 12) \emptyset
- 13) \emptyset
- 14) \emptyset
- 15) \emptyset
- 16) $4\frac{4}{9}$ hours
- 17) $2\frac{11}{12}$ hours
- 18) $23\frac{1}{3}$ minutes
- 19) 12 minutes
- 20) baker: 20 minutes
assistant: 80 minutes
- 21) baker: 15 minutes
assistant: 60 minutes
- 22) baker: 35 minutes
assistant: 140 minutes
- 23) $4m^2 - 7m + 6$
- 24) $6m^2 - 7m + 5$
- 25) $4r^2 + 5r + 4$
- 26) $3r^2 + 3r + 5$
- 27) $2x^2 + 4x + 4$
- 28) $3x^2 + 18x - 4$
- 29) $2x^2 - 2x + 5 + \frac{2}{3x - 4}$
- 30) $-2x^2 + 4x + 5 + \frac{4}{3x + 2}$
- 31) $x^3 + 6x^2 + 36x + 216 + \frac{2592}{x - 6}$
- 32) $x^3 + 2x^2 + 4x + 8 + \frac{32}{x - 2}$
- 33) 12
- 34) 11
- 35) 6

Answer Key

Testname: Q6 PREP CH 5.5, 5.6, 5.7, & 6.1 V01

36) 3

37) 4

38) 3

39) $\frac{1}{10}$

40) $\frac{1}{4}$

41) $\frac{13}{20}$

42) $\frac{7}{11}$

43) 16

44) 81

45) $\frac{1}{4}$

46) $\frac{1}{2}$

47) 5

48) 8

49) $x^{2/9}$

50) $x^{8/9}$

51) $x^{13/6}$

52) $x^{11/6}$

53) $x^{11/6}$

54) $x^{1/8}$

55) $x^{1/8}$

56) x^5y^3

57) x^2y^3

58) x^3y^2

59) $x^{4/77}$

60) $x^{6/55}$

61) x^3y^4

62) $\frac{x^{2/5}}{y^{5/2}}$

63) $\frac{1}{x^{18}}$